BEYOND THE REGIONAL DEVELOPMENT PARADIGM: THE LIMITS OF TRANSPORT BASED POLICIES IN SPAIN

Angel Aparicio. Technical University of Madrid, Spain. angel.aparicio@upm.es

ABSTRACT

This paper reviews the transport and economic development trends for the last 20 years in Spain at a detailed (province or NUTS3) level. As Spain has sustained a significant transport investment effort in this period, with the support of EU funding, this review offers an excellent perspective to put some further light on how the transport-and-regional-development paradigm has shaped decision-making in the transport sector. The paper reviews changes in gross domestic product (GDP), population and motorway endowment for the 47 provinces in mainland Spain. Regional development trends seem to be closely associated to particular local conditions, not clearly associated to transport (motorway) infrastructure endowment. This is consistent with the fact that transport infrastructure has not generally been a critical bottleneck for trade and economic activity during this period. The paper concludes that, in general terms, transport infrastructure investment does not seem to be clearly associated to the otherwise substantial differences in regional development among Spanish mainland provinces during this period.

The actual relationship between transport infrastructure expansion and economic growth can be better explained as a consequence of the decision-making process. An econometric analysis supports the idea that the growth of motorway networks within provinces in the 20-year period considered could be partially explained as a consequence of GDP growth and a change in policy objectives experience at the mid of the period. Accordingly, decision makers would give priority to motorway expansion in those regions experiencing lower economic growth and to those provinces with lower motorway densities (less than 50% of the national average). The impact of the first variable would be modest: an increase of 1% in the GDP difference between 1989 and 2008 would correspond to a decrease of merely 0.4% in motorway density), whereas the focus on those provinces poorly equipped would represent a 25% increase in motorway density in those provinces. This policy would have been consistent with the current view of the Spanish economic expansion in this period as dominated by population growth, expansion of low productivity sectors and intensive urban development, although this question is not further analysed in this paper. These policy decisions were largely encouraged by EU policies, and found a favourable environment in the complexity and rigidity of multi-layered governance, which made it difficult to move resources from transport to other sectors and particularly to those controlled by regional authorities, such as environmental and research and innovation policies (focused on non-physical measures). An additional support to

this policy was the technical ambition of creating state-of-the art, homogenous transport networks covering the whole country.

Keywords: national transport policy, Spain, motorways and regional development

TRANSPORT AND REGIONAL DEVELOPMENT IN EUROPE

The relevance of regional development within EU policies has increased as the EU expanded. With the accession of Greece, Portugal and Spain in the 1980s, the resources dedicated to regional development increased substantially, and were complemented, since 1993, by the so-called Cohesion Fund. The objective of "social, economic and territorial cohesion" was first enshrined in the 1997 Treaty of Amsterdam (articles 154 and 156). This trend gained new priority with the enlargement of the EU to Central and Eastern Europe in 2005 and 2007. The Treaty of Lisbon, signed in 2007 and in force since January 1st 2009, identifies the promotion of "*harmonious development across de the EU and a reduction in disparities among regions*" as one specific objective of the EU policies (article 174 and 175).

Transport has traditionally been considered as a significant contributor to regional development within the EU. A major argument was the need of improved accessibility to markets for lagging regions. The role of transport received closer attention after the implementation of the single market (January 1st, 1993), as transport was considered as a critical condition for the operation of the single market. The European Council identified 14 priority projects in 1994, and the guidelines of a whole Trans-European Transport Network (TEN-T) were approved in 1996.

Under this context, increasing financial resources were made available to member states. This strategy, initiated in the 1980s was formalized by the expansion of regional development policies in the 1990s (expansion of the ERDF and creation of the Cohesion Funds), the approval of the first 14 priority transport projects (1994) and the trans-European transport networks (1996), and the approval of the European Spatial Development Perspective in 1999 (EU Committee on Spatial Development, 1999): The main EU programmes financing transport infrastructure are the TEN-T Fund, the European Regional Development Fund (ERDF) for less developed regions and the Cohesion Fund (CF) for "cohesion countries" (member states significantly below the EU average Gross Domestic Product, GDP). These funds provide partial financing (up to different ceilings, according to the characteristics of the project, the region and the specific rules for each instrument) of transport infrastructure construction costs. Social cohesion and other policies not related to infrastructure were funded by the European Social Fund and by a small part of the ERDF.

Although the 2008 economic downturn launched an ambitious reflection on emerging global and environmental challenges, and the role of innovation to cope with them (European Commission, 2010a), the recent revision of these regional development policies (European Commission, 2010b) states that "the capacity to move people and goods by rail, road or water remains critically important".

Formally, the general approach to regional development has moved from "reducing disparities" in the early 1990s to a focus on "strengthening competitiveness", but this has not significantly modified the capacity of transport infrastructure to keep attracting substantial EU financial

resources. Transport networks continue being seen as both, a crucial support for the operation of the EU's single market and as a way to improve regional productivity.

In spite of its modest amount compared to the national economy (in the case of Spain, EU regional development funds account now for around 0.5% of GDP), the European Funds have been critical in shaping public investment priorities, thanks to its "co-funding", project-based mechanism. This has generally resulted in a priority to transport infrastructure policies in cohesion countries, particularly noticeable in Spain.

THE ACADEMIC CONTROVERSY AND SOME RECENT RESEARCH RESULTS

The actual results of this European policy on regional development and cohesion has been analysed from a variety of perspectives, leading to an open-ended debate involving geographers, economists, transport experts and planners. For the sake of clarity, the arguments can be structured into four major categories: (a) econometric approaches, identifying the association between transport infrastructure endowment and economic performance; (b) spatial computable general equilibrium models (SCGE), derived from the classic location theories; (c) dynamic studies, derived from the New Economic Geography (NEG), focusing on agglomeration and dispersion effects and economies of scale; (d) accessibility and network studies, focusing on accessibility (rather than regional GDP) as a key indicator for regional cohesion.

Within the econometric approaches, Aschauer's study (Aschauer, 1989) on the relationship between the stock of public capital and regional productivity, although limited to the US economy, had a significant influence in Europe, as it was published during the critical years when the cohesion and TEN T policy were being designed and negotiated. It is worth noting that Aschauer did not make a distinction among the various components of the stock of public capital, and did not try to make a particular point on transport infrastructure investment. This point, focusing on transport infrastructure in the European context, had already been developed by a European working group in 1986 (Biehl, 1986) and was further developed by the working group chair, Dieter Biehl (1991), widely influencing discussions on the role of transport in EU policies. Since then, many researchers have applied Aschauer's approach to the European regional context, including more variables in the econometric relationship and individualizing transport infrastructure and other components of public capital (such as telecoms or research and innovation-related infrastructure), with the result that the relevance of transport infrastructure endowment has progressively waned (Crescenzi et al, 2011; Mas, 2009).

SCGE models have been increasingly used to describe and capture the economic relationships among regions (Adler and Proost, 2010). Transport infrastructure improvements are translated in the model in terms of reduction of the transaction costs for tradable goods among regions. Recent research results in this field (Bröcker et al, 2010), applied to the 2003 list of EU transport priority projects, shows limited welfare effects for most of them. In fact, the modest impact of transport infrastructure on regional growth, as reported by some of the SCGE models, is not surprising: As transport infrastructure endowment levels are already high

in most of Europe, the impact of any further improvement on transport costs and on final consumer prices become increasingly negligible.

The NEG puts the focus on economies of scale, aggregation (clustering) trends and relocation. This approach has moved the attention towards the centre-periphery relationships within Europe and the so-called asymmetric relationships, which, under specific circumstances, could result in further concentration of economic activity in central regions, while weakening the competitive position of industries in lagging-behind regions, once better transport access is provided (Lafourcade and Tropeano, 2000; Puga, 2002; Harrison, 2006; Krugman, 2010).

Accessibility studies try to capture some of the spill-over effects, i.e. the impact of new transport infrastructure within one region in its neighbouring regions. Transport planners saw it as a way to further justify the need for more homogenous, balanced transport networks (MOPTMA, 1995). Researchers state that results are highly dependent on the accessibility index chosen (López, Gutiérrez and Gómez, 2008); furthermore, it is difficult to identify threshold or reference values, and infrastructure standards (such as design speed) and not capacity or level of service become the relevant parameter in the analysis. When the relative weight of regions (in terms of population or Gross Regional Product) is taken within the indicator, accessibility gains in areas far away from major centres, is small, even in the presence of major transport improvements. An alternative source of information has come from surveys addressed at decision-makers within firms and companies from various industries, in order to identify the relevance of accessibility (and eventually of particular transport infrastructure projects) on their location decisions. (Crescenzi and Gutiérrez-Pose, 2012) These surveys usually give significant relevance to accessibility, but these results have been criticized with a variety of arguments: on the one hand, because people interviewed may be biased towards supporting further infrastructure investments; on the other hand, because relocation of economic activities from one region to another would merely be a zero-sum game.

In light of all these efforts, it could be said that the debate on the importance of transport infrastructure in regional economic development will stay alive for some time to come. In fact, one of the lessons of reviewing past research in this area (Gordon, 2006) is that controversy is probably the only way to move forward. This paper aims, if not at putting more light, at keeping this controversy alive.

THE APPROACH: EVIDENCE FROM 20 YEARS OF TRANSPORT-FOCUSED POLICIES IN SPAIN

Whereas EU-wide studies allow for the consideration of a sample of regions with different conditions (policies, economic structure, governance, etc.), the study within a specific country reduces the number of variables, and facilitates the interpretation of results, within a more homogeneous policy and political context.

In the case of Spain, sustained transport infrastructure investment has been a shared priority of all governments since the mid-1980s, sustained at levels well above 1% of GDP for most of this period. These values are significantly higher than those reported by most Western European countries, usually around 0.8% (ITF, 2011).

The research approach aims at clarifying whether this policy has resulted- as frequently claimed by most of the national political and economic elite- in stimulating economic development and social cohesion. Furthermore, it will analyse how decision-making in transport policy has been shaped by this paradigm.

The approach combines the review of planning and policy documents, with the analysis of basic data from the 47 provinces (NUTS3) in mainland Spain for 1989 and 2008. Provinces are more homogeneous in terms of extension/surface than regions, and allow for a more detailed analysis than regions (NUTS2), the unit level common in many EU-wide studies. Motorways will be taken as a proxy to characterize transport infrastructure development: in fact, transport infrastructure investment in this 20-year period focused primarily on motorways (rail, airport and port investments grew significantly only in the last decade), and was continued until the end of the period (in spite of growing evidence about decreasing socio-economic benefits). In this study, all the various levels of dual carriageways with a design speed above 120 km/h are included under the term "motorways"; they currently account for 9% of the total interurban road network. The analysis is undertaken in three complementary steps.

The first step is based on a qualitative analysis of the key policy drivers of transport in Spain in the period between 1989 and 2008. It describes the investment effort in the period, the characteristic of the main projects addressed, the relevance of EU funding, and the consolidation of a strong national construction industry.

In the second step, a qualitative analysis of the relationship between socio-economic development and motorway density is made at the province level. Socio-economic development is characterized in relative terms. For each province, GDP and population are divided by the province's surface; the resulting values are subsequently divided by the national average. The difference between the 2008 and the 1989 values are taken as an indicator of relative gain (if positive) or loss (if negative) for each province, compared to the rest of the country. A similar indicator is calculated based on per capita GDP. The 3 indicators show a variety of situations of "wining" and "losing" provinces, in relative terms, which can be mapped. The differences in motorway density values (km of motorways/province surface) for the same period 1989 and 2008 are also computed and mapped. This facilitates the identification of potential associations between the socio-economic evolution of certain provinces and motorway endowment.

Finally, a number of associations between the socio-economic variables and motorway density are analysed with econometric techniques. Following the conclusions at the previous step, this analysis primarily looks at the socio-economic variables as explanatory variables of decisions taken to increase motorway density in some provinces. The combined results from these complementary approaches provide some elements to describe decision-making in Spanish transport policies as moving away from traditional project assessment techniques, towards a "network approach" aiming at developing a homogeneous transport system covering most of the territory with high design standards, even where demand analysis would suggest to adopt more modest ones.

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RESEARCH RESULTS

The Policy Context: Transport Infrastructure Investment and Financing in 1989-2010

Investment in transport infrastructure has grown steadily in Spain since the mid-1980s. In 1985, it accounted for only 0.70% of the national GDP. In 1988, it was already higher than 1.0% of GDP, and since 1990, higher than 1.5% (FIGURE 1). Between 1995 and 1997, transport infrastructure investment slightly declined (as a result of the economic restructuring connected to the attainment of the economic convergence targets to enter the Euro zone), although keeping values above 1% of GDP. This was followed by a new period of quick expansion, so that transport investment has stayed at levels above 1.7% since 2002. This historical trend is quite different of the prevailing one in Western Europe, where transport infrastructure investment has declined from 1% in the 1980s to around 0.8% since 2000 (ITF, 2011).

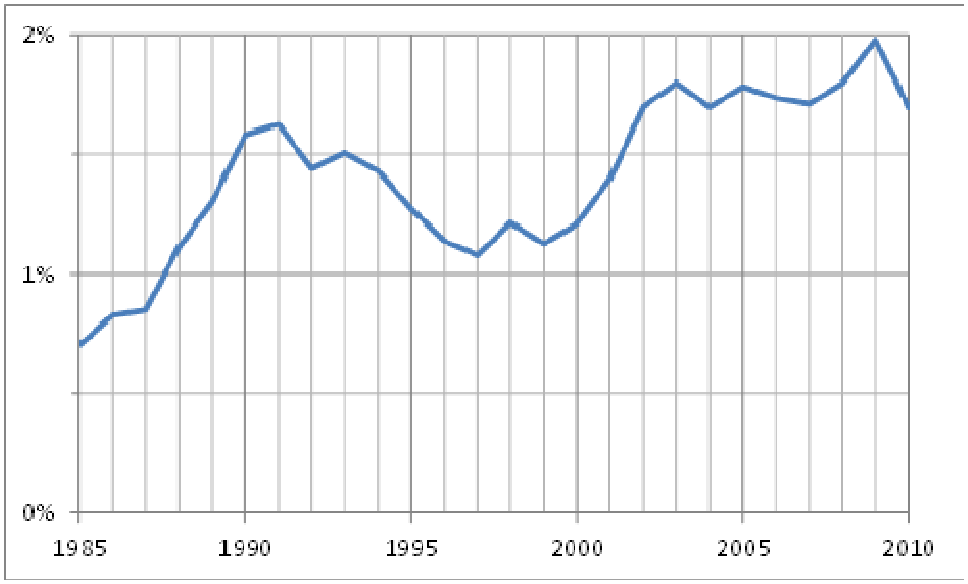

FIGURE 1 : Transport infrastructure investment in Spain as a percentage of GDP (source: Ministerio de Fomento)

EU's regional development funds played a key role in this upwards trend. In 1989-1993, EU's ERDF funding dedicated to transport infrastructure in Spain reached € 3,290 million, or 13% of the total transport infrastructure investment in Spain. Since 1993, ERDF funding was complemented by the new Cohesion Fund (which in its first year of operation, 1993, already transferred € 606 million to Spain for transport infrastructure). The effect of EU funding was twofold: on the one hand, it served to keep a continuous effort on the implementation of strategic national projects (mostly motorways), even in the context of economic downturns (such as the one experienced in 1993); on the other hand, it significantly relaxed the assessment thresholds for the approval of new projects: once the most socio-economic profitable projects had been completed (mostly in the 1985-1995 period), they were replaced by more dubious projects, under the justification of the need to expand transport networks so that they could cover most of the territory with similar design standards. These trends were fostered by the approval, since 1993, of the new cohesion fund, which allocated some € 4,600

million in the period 1994-1999 to the already hefty € 6,648 million of the ERDF. In this period, the relative coverage of transport infrastructure investment by EU funding in Spain stayed at a similar level that in the previous period (13% of the total).

One of the most significant by-side effects of this policy was the expansion of the construction industry in Spain. The public works market year-to year growth in 1988-1991 stayed above 10% (with an impressive peak of more than 25% in 1989) and, after some ups and downs in the early 1990s, it entered a golden period of steady expansion since 1998 with annual growth figures close to 7% (Lleonart, 2004). This trend suddenly comes to a halt and then to a progressive reduction after the 2008 economic downturn, as the projects already launched before the economic downturn are completed and are hardly replaced by new ones. However, the Spanish industry had already consolidated by then, and gone global: Six Spanish companies were within the top 20 European Construction firms in 2010 (Deloitte, 2011), and for three of them international revenues accounted for more of 40% of their total revenues.

The figures above supports the idea that EU funding was crucial for mobilizing a national investment effort much higher than the one strictly needed to comply with the EU financing rules (EU funding could cover, in some specific cases, up to 80% of the project price tag), and to sustain this effort for more than two decades. In spite of the attention received by EU regional policies from many researchers, a comprehensive analysis of the governance and decision making processes behind these facts is still lacking. In the interim, some elements can tentatively be pointed out:

- The EU success in creating a conceptual vision on the relevance of territorial cohesion as a major political goal and on the substantial contribution that transport infrastructure could make to the achievement of that goal. This vision was in fact shared by the more influential political parties and economic and social agents in Spain and in most of the EU.
- The practical lack of alternative development strategies, involving social programs, the environment or urban regeneration. The results of those programs (applied sometimes as pilots) were considered difficult to monitor and to assess, and raised more accountability concerns within EU services that simpler building projects, such as the ones provided by the transport sector.
- The consolidation of project management and monitoring mechanisms within the European, national and regional bureaucracies, which provided for a reliable and transparent use of the funding in physical projects, and for simpler scrutiny and assessment methods.

One interesting by-side effects of this transport policy has been the progressive lack of relevance of traditional project assessment mechanisms (such as cost-benefit analysis), replaced within the transport planning process by a network approach, which gives priority to accessibility, i.e. to the homogeneity of the networks in the territory, and the choice for cutting-edge, faster solutions (such as high speed rail). Projects through areas with low population, lacking sufficient direct economic benefits due to low demand prospects, move forward in the decision-making pipeline on the basis of fuzzy "indirect benefits" and fairness among regions (Aparicio, 2010, de Rus, 2007).

Changing Economic and Demographic Trends in Spain

A comparison of population and GDP data at the province level in Spain shows significant changes between 1989 and 2008 period. Most interestingly, although population movements are associated to GDP growth, they do not necessarily correlate with changes in per capita GDP.

The 1989-2008 context is one of impressive population and economic growth at the national level (respectively, 17% and 75% in the 1989-2008 period, or 0.8% and 3.0% annually). Relative changes among provinces are better captured by dividing their values by the national average in both years. The difference between the 2008 and the 1989 indexes for one particular province provides a straight measure of its relative progress or decline compared to the whole of the country. Figure 3 summarizes these results showing the 6 resulting categories of provinces (FIGURE 2):

- Net winners: Provinces which improved their relative position (compared to the national average) in terms of population, GDP and per capita GDP.
- Apparent winners: Provinces which improved their relative position in terms of population and GDP, but with a relative lost in terms of per capita GDP. This is due to the fact that GDP expansion in those provinces was more than compensated by population growth.
- Emerging winners. Provinces which improved their relative position in terms of GDP, but not to the same extent in terms of population. This results in relative gains in terms of GDP per capita. This is due to the fact that GDP relative gains in those provinces were more important than population relative gains.
- Attractive losers. In spite of their relative economic loss in terms of GDP and GDP per capita, these provinces have kept attracting population, resulting in relative population gains within the country.
- Adaptive regions. In spite of losing relative relevance within the country in terms of population and GDP, they managed to gain relative weight in terms of per capita GDP.
- Net losers. Those provinces, which have experience a loss of their relative weight at the national level in terms of population, GDP and GDP per capita.

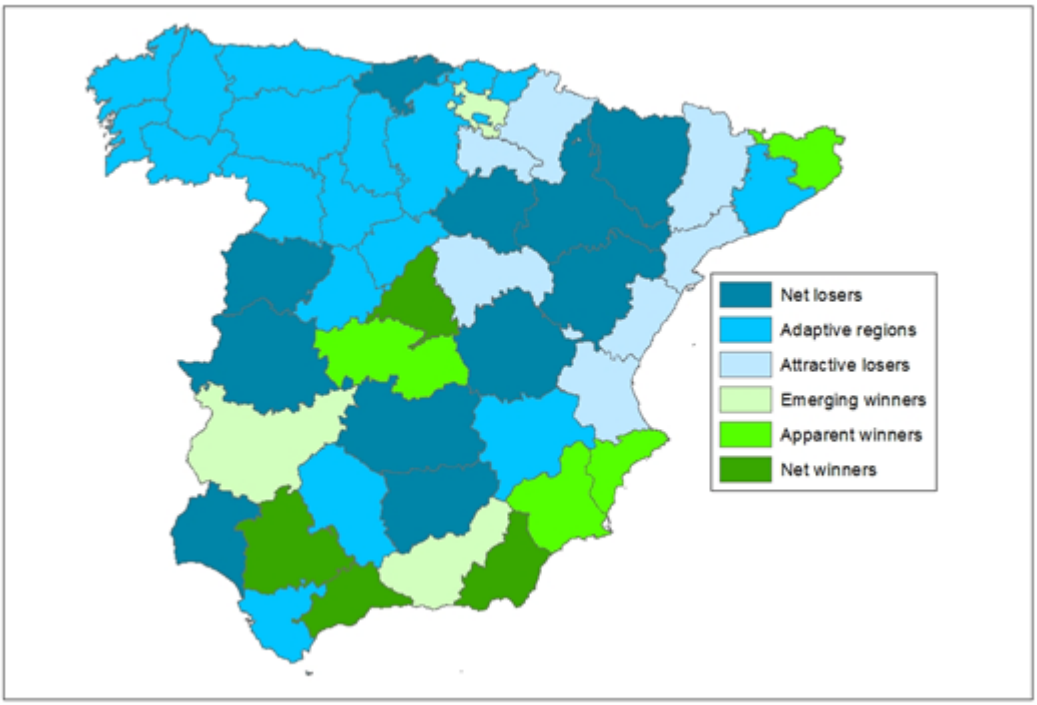

FIGURE 2: Major Socio-Economic Changes 1989-2008

There is no apparent association among this typology of provinces and variations in terms of motorway endowment in the same period (FIGURE 3). Population and economic trends seem to be the consequence of complex processes, where transport infrastructure does not play a relevant role. It is worth noting that the 2008 national average was quite high, compared to European standards (29.9 km/1000 km^2), and the minimum province motorway density in Spain in 2008 was also significant, 7.2 km/1000 km^2. These figures support the argument that, well before 2008, transport infrastructure was no longer a relevant bottleneck to regional development. This would be consistent with the picture showed in Figure 2. In fact, in 1989 the country already enjoyed a reasonably dense road system, with rare bottlenecks, and motorway expansion did not seem to have been critical at any time for economic development. However, motorway expansion could certainly have favoured other economic effects, such as corporate organization (particularly involving the public works industry): this would replicate the classic debate on railway and economic development in the XIX century (Gordon, 2006).

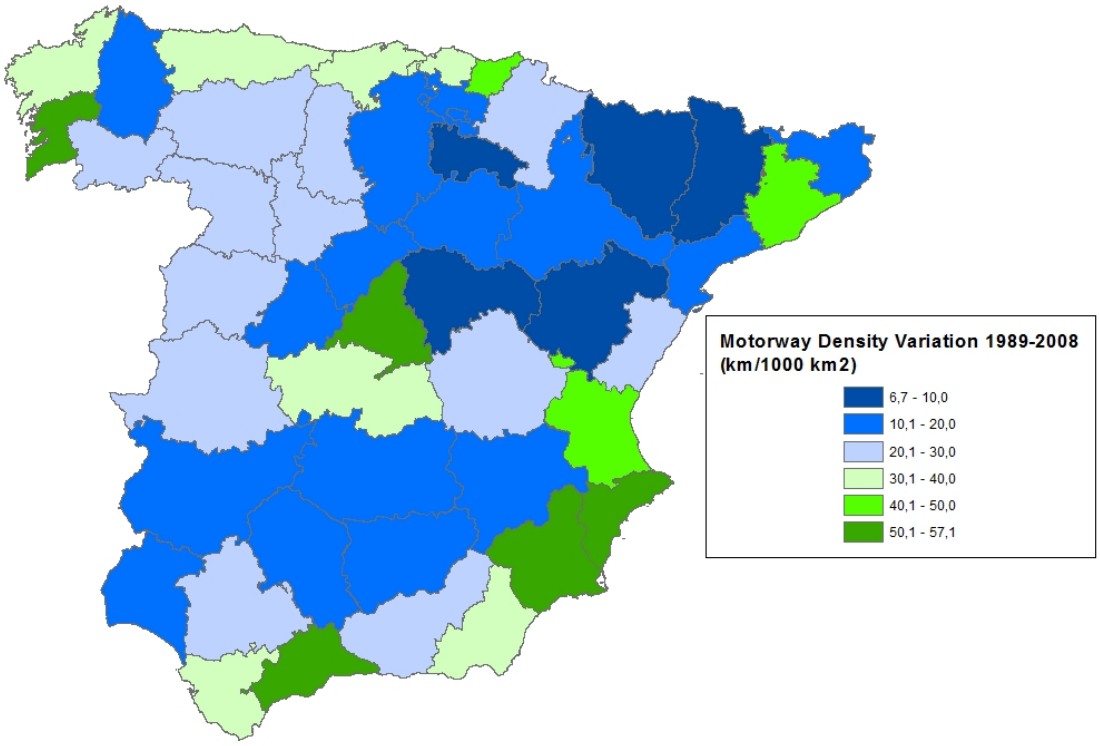

FIGURE 3: Motorway Density. 1989-2008 Variations (km / 1,000 km^2)

An econometric analysis on motorways and provincial GDP growth

The econometric analysis provides a closer look to the association between regional development and motorway endowment in the 47 provinces in mainland Spain. The analysis is based in the variables shown in Table 1.

TABLE 1: Description of variables

	Unit	National	Mean	Minimum	Maximum	St.Deviation
Surface	km^2	505,963	10,119	1,980	21,766	4,756
Population density, 1989	Inh../km^2	78.8	110.6	9.4	626.4	141.3
Population density, 2008	Inh./km^2	92.4	129.3	9.2	795.6	165.8
GDP/ Surface, 1989	10^6€/km^2	0.537	0.783	0.065	5.218	1.138
GDP/Surface, 2008	10^6€/km^2	2.149	3.149	0.203	24.047	4.765
GDP per capita, 1989	€/inh	6,817	6,637	3,953	11,063	1,535
GDP per capita, 2008	€/inh	23,263	22,000	15,139	34,486	4,474
Motorway density, 1989	km/km^2	8.5	12.8	0.0	67.3	16.4
Motorway density, 1999	km/km^2	29.9	36.6	7.2	120.1	24.6

An econometric analysis undertaken for the variables already analysed in the former section has been unable to find any relevant association between the relative gains and loss of the provinces within the period (1989-2008) (dependent variable) and the relative gains or loss in the other three variables (GDP per surface, population density and motorway density). The results are summarized in TABLE 2, including the OMS estimates for the coefficients and, in

brackets, for their standard errors. The model took differences in relative per capita GDP as the dependent variable and, as independent variables, differences in relative province values for population density, motorway density and GDP density. This seems to be consistent with the discussion in the previous section, and would suggest that provinces follow complex regional development partners, in which motorway endowment do not seem to play a statistically significant role.

TABLE 2: Regression Results for Model 2

	(1)	(2)	(3)	(4)
Difference in relative population density 1989-2008	0.035 (0.024)	-0.021 (0.025)	---	-0.020 (0.024)
Difference in relative motorway density 1989-2008	-0.023 (0.015)	0.003 (0.015)	0.00008 (0.014)	---
Difference in relative GDP 1989-2008	---	0.023 (0.005)	0.020 (0.004)	0.022 (0.005)
Constant	-3.475 (2.237)	-3.002 (1.924)	-2.812 (1,907)	-3.093 (1.861)
R2 adj	0.042	0.294	0.297	0.307
Dependent variable: Relative differences in per capita GDP (compared to national average) 1989-2008 *Red figures: p-value > 5% (Coefficient not significant different from 0)*				

An interesting result is obtained with a model of first differences. The dependent variable is the difference between per capita GDP in 2008 and 1989 and the independent variables, the same differences for population density and motorway density (TABLE 3). Both coefficients are now statistically different from 0 with a level of significance of 5%, but with a very low (and ironically, negative) value: an increase of motorway density of 1km/km2 between 1989 and 2008 would yield a decrease in per capita GDP of € 17 in the same period. This result does seem to be significant enough to challenge the previous conclusion about the dubious influence of motorway density growth on GDP growth. This is consistent with other studies in Europe (Crescenzi and Rodríguez-Pose, 2012).

TABLE 3: Regression Results for Model 2

Independent variables	OMS Estimates and St. Error
Difference in population density 1989-2008	-25.34 (12.61)
Difference in motorway density 1989-2008	-17.05 (2.64)
Constant	14,863.03 (355.83)
R2 adj	0.478
Dependent variable: Differences in per capita GDP 1989-2008 *Red figures: p-value > 5% (Coefficient not significant different from 0)*	

An econometric analysis on decision making

The discussion made on decision making can be further illustrated with an econometric analysis. As no solid evidence has been found on the effect of motorway expansion on economic growth at the provincial level, the relationship can be studied from a different

perspective. Are there any variables, linked to GDP or population, which could explain why decisions are taken to expand the motorway network in some particular provinces? The former discussion suggested that decision-takers have increasingly considered accessibility and network balance as an objective in itself, while traditional economic assessments (cost-benefit) were losing influence.

This frame can be approached by a simple first difference model, taking the differences (2008-1989) in motorway density as the dependent variable, and differences in GDP and population as independent variables. The change in policy priorities can be roughly approached by a dummy variable (POLICY99), which takes as a reference the middle of the period (1999). In fact, in the late 1990s, most of the strategic motorways had been completed, and the attention of policy makers moved towards new motorways in less dynamic territories, for the sake of "territorial cohesion". This policy variable takes the value 1 for those provinces with motorway density lower to half the national average. The population density appears not to be significant, and a better adjustment is attained while considering GDP density instead of GDP per capita as an independent variable. Motorway density and GDP density are introduced with logarithms, in order to diminish heteroskedasticity problems. The results are summarized in TABLE 4.

TABLE 4: Regression Results for the Decision-Making Model

	Coefficient	St.Error
log[Dif(GDP/km2 1989-2008)]	-0.434	0.145
Policy 1999	0.251	0.121
Constant	1.059	0.065
R^2 adj	0.405	
Dependent variable: log[Dif(Motorway density 1989-2008)] *Red figures: p-value > 5%*		

This simple model shows a significant degree of association of the difference in motorway density with the two independent variables. During the whole period (1989-2009) those provinces showing a positive economic performance would have got lower motorway expansion levels: the greater the relative increase in GDP density during this period, the lower the relative increase in motorway density. The change of policy in 1999 would result in a significant focus on those provinces with lower motorway densities, resulting in an increase of 25%. This would be consistent with policy makers' concerns about accessibility in these areas, and with the subsequent expansion of construction activities for new housing and commercial services which subsequently swept the country.

It is worth noticing that the expansion of motorway networks resulted in high endowment levels in most of the country: in 1989, 39 out of 47 provinces had densities below 20 km/1,000 km2; in 2010, this figure had come down to only 13 provinces. This trend was couple with increasing disparities, with a growing number of provinces with high density levels: in 1989 only 5 provinces had motorway densities above 40 km/1,000 km2; in 2010, 17 provinces were already above that level.

The general picture emerging from these models is that the concerns of policy makers to "compensate" some lagging provinces with motorway investment was certain, but it did not

paid off in terms of economic development. A picture seems consistent with some of the elements of the current consensus on the analysis of the Spanish economic boom in 1996-2008: economic development based on population growth, generally coupled with loss of productivity, and with significant urbanization processes, supported by motorway accessibility.

INSTITUTIONAL DRIVERS OF DECISION-MAKING

The obvious question is how a costly policy of transport infrastructure development has main maintained and even invigorated in Spain for more than 20 years, in spite of its poor performance in terms of regional development. Policy decisions could be considered to have been influenced by three convergent logics: the logic of European policies, the logic of technical optimization and the logic of assignment of public resources in multi-layered governance structures.

European policies have consistently underlined the virtues of transport infrastructure expansion on economic development (European Commission, 2010b and 2011). They have provided strong incentives to national and regional authorities in order to consider transport infrastructure investment as an efficient way to capture EU subsidies and to achieve their development goals. Alternative development strategies, such as environmental quality or innovation, have found serious difficulties to mobilize funding, for a variety of reasons (high operational costs, major challenges for assessing and monitoring actual implementation and results…).

Transport planning has dramatically evolved in a context of growing availability of European funding and of an increasingly efficient and smoother project implementation system (Aparicio, 2010). The traditional hard choices among competing projects, based on cost-benefit analysis, which had been usual in the 1980s, were progressively replaced by the ambitious choice of upgrading and expanding whole transport systems and networks to state-of-the-art standards. In spite of the relevance given by planning documents to integration and multimodality (Ministry of Public Works, 2005), modal networks kept broad autonomy, and were expanded even to places with uncertain, if any, transport demand.

The Spanish multi-layered governance system added for some rigidities in the resource allocation and decision making process. On the one hand, it favoured continuity in the allocation of substantial funding to national transport infrastructure networks, controlled by the national government, instead of progressively channelling more resources to other sectors, such as the environment or research and innovation, which fell in the realm of responsibility of regional authorities. On the other hand, regional authorities were pushed to a position of claiming for the expansion of modern transport networks to their regions, as the sole means to benefit from the national government's substantial investment policy.

The current picture of the motorway network reflects these trends: extensive network length, with a significant percentage (more than 20%) of it with low traffic demand (less than 10,000 annual average daily traffic); high design standards; high permeability (frequent interchanges, typically every 5 km compared to 30 km in the toll motorways developed in the 1970s), and poor complementarity with the all-purpose road network and with the rail network.

CONCLUSIONS

This paper has explored the decision-making environment that made it possible to keep and expand a transport-infrastructure focused regional development policy in the European Union, taking Spain (the EU country where transport infrastructure expansion has been more relevant since the 1980s until now) as a case study for identifying some of the driving forces behind these policy trends.

The case study analysis, undertaken at the province level, is consistent with the results of previous studies for the whole of the EU at the regional level, showing no apparent association between transport infrastructure endowment (motorways) and regional development between 1989 and 2008. In spite of the substantial socio-economic changes in many of the provinces during this period, these changes do not seem to be related to the relative gains in terms of motorway density.

Decision-making seems to have increasingly been driven by a concern to expand the motorway system in a balanced way covering all the provinces. In a context of extensive motorway construction, a significant effort was diverted toward those provinces with lower motorway densities, rather than to those presenting higher population or economic growth, or simply, to stop the programme and dedicate the resources to other policies.

These policy decisions were largely encouraged by EU policies. Transport has always been considered in the EU as a key facilitator of integration and regional cohesion, creating an environment in which transport investment is prioritized versus other development strategies. The complexity and rigidity of multi-layered governance has made it difficult to move resources from transport to other sectors and particularly to those controlled by regional authorities, such as environmental and research and innovation policies (focused on non-physical measures). As these policy trends are largely been followed currently by Eastern and Central European countries, it seems necessary to look in further detail to their merits and drawbacks, and particularly to efficient ways to facilitate permeability of funding allocation from transport to other sectors, once basic transport needs have been met.

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